because it leads them to broad and philosophic views. Both books are tenth editions, a fact which shows that they have been appreciated; and doubtless they will maintain their high reputation for some time to come.

MESSRS. BREWSTER, SMITH AND CO. have sent us a pamphlet describing an improved form of sulphuretted hydrogen apparatus. The apparatus, which has been designed by Dr. F. M. Perkin, is so arranged that either a constant supply of the sulphuretted hydrogen gas or a saturated aqueous solution can be obtained. It is well known how rapidly an aqueous solution of sulphuretted hydrogen decomposes and becomes unfit for use. The new apparatus is so arranged that the surface of the solution has always an atmosphere of the gas over it, therefore no oxidisation can take place, and the solution is always saturated. The generating part of the apparatus is a slightly modified form of the apparatus first described by De Koninck, and contains a large supply of acid and of ferrous sulphide, so that when once fitted up it can be used for four or five months without being recharged. In this respect it is certainly an improvement over the "Kipp" apparatus, which requires constant recharging and wastes both of acid and sulphide.

THE additions to the Zoological Society's Gardens during the past week include a Squirrel Monkey (*Chrysothrix sciurea*) from Guiana, presented by Captain W. A. S. Copp; two Lesser White-nosed Monkeys (*Cercopithecus petaurista*) from West Africa, presented by Mr. P. Zaffere; two Laughing Kingfishers (*Dacelo gigantea*), a Black-backed Piping Crow (*Gymnorhina tibicen*) from Australia, presented by Captain Westcott; two Alligators (*Alligator mississippiensis*) from Southern North America, presented by Mr. Percival H. Hancock; a Common Snake (*Tropidonotus natrix*), British, presented by Mr. W. Swan Sonnenschein; a Pluto Monkey (*Cercopithecus leucampyx*) from West Africa, two Marica Gazelles (*Gazella marica*) from Arabia, a Common Roe (*Capreolus caproea albino*), European, deposited; four Lapwings (*Vanellus vulgaris*), European; fifteen American Mud Fish (*Amia calva*), twelve Long-eared Sunfish (*Lepomis auritus*), six Black Bass (*Huro nigricans*) from North America, purchased.

OUR ASTRONOMICAL COLUMN.

THE ANNULAR ECLIPSE OF THE SUN, NOVEMBER 10, 1901.—In the *Comptes rendus* (vol. cxxxiii. p. 768) there is a communication from M. Janssen stating that he has received by telegram notice of the success of the expedition sent to Cairo to observe the recent annular solar eclipse. He had requested M. de la Baume Pluvinel to photograph the spectrum of the solar light grazing the moon's limb; this had been done, and the photographs showed no trace of any absorption which might suggest the presence of a lunar atmosphere. M. Pasteur had obtained large-scale photographs of the sun with granulations. The result of the expedition was therefore to be considered entirely successful.

THE LEONID METEORS, NOVEMBER, 1901.—A telegram to the daily Press through Reuter's agency announces that a considerable number of meteors have been observed in localities where the weather conditions were propitious. Advices from many stations in the United States report more or less brilliant displays of the Leonids as having been seen on Thursday and Friday nights. A steamer from New Orleans reports having seen a great shower near Cape Hatteras early on Friday morning (November 15). The only night on which the sky was at all favourable in London was Thursday, November 14, and on that occasion continual watch was kept by three observers at the Solar Physics Observatory from 11 p.m. to 4 a.m. A few meteors were seen, from twenty to thirty, but nothing in the semblance of a definite shower was presented. Many of the shooting stars seen were very brilliant, but those traced out as being Perseids or Taurids were as numerous as those decidedly radiating from the sickle of Leo, so that probably there was nothing more than is to be seen on any good night for the same interval of time. Several photographic cameras were being exposed in different directions in the hope of recording trails, but without success. The 6-inch prismatic camera was adjusted some distance ahead of the radiant, on the star Pollux (β Geminorum), and a very bright meteor was observed to pass close to the star; but although special care was taken in development, nothing beyond the star spectrum was obtained on the plate.

STRUCTURE OF THE REGION AROUND NOVA PERSEI.—A considerable advance in the knowledge of the surroundings of Nova Persei has resulted from the examination of photographs obtained by Mr. G. W. Ritchey with the 24-inch reflector of the Yerkes Observatory. A reproduction of one of these photographs is given in the *Astrophysical Journal* (vol. xiv. pp. 167–168) in illustration of a short description of the appearances found on examining the negative. This photograph was obtained on the night of September 20, 1901, on a Cramer "Crown" plate of specially high sensitiveness, with an exposure of 3h. 50m.

The first glance at the photograph shows that the false penumbra which has been recorded with refracting telescopes is entirely absent. The image of the Nova is some 20″ in diameter on account of the long exposure, but there is little or no halo of nebulosity immediately about it. Completely surrounding the star, however, is a large elliptical belt of nebulosity some 20′ of arc in diameter, with patches of varying density, the most intense being on the southern half of the ring. These latter are probably identical with the four principal condensations mentioned by Prof. Perrine, the photographs of which with the Crossley reflector of the Lick Observatory show evidence of motion of these constituent portions of the nebula. As much of the finer detail is necessarily lost in reproduction, a drawing is appended showing the structure to be seen on the original negative. This shows the nebula to have a very complex structure, and the question as to whether it is spiral or consists of several annuli with interlacing branches cannot yet be decided. An exceedingly suggestive feature is the existence of two moderately dense wisps of nebulosity, extending from the Nova towards the west, which then curve towards the north and merge into the main convolutions of the nebula. A later circular just received from Kiel contains the important announcements that:—

November 12.—Ritchey states that a photograph obtained at the Yerkes Observatory on November 9 confirms the large motion of the nebula near the Nova.

November 13.—Ritchey finds the nebula surrounding the Nova probably expanding in all directions.

PROPER MOTION OF NOVA PERSEI.—Herr Östen Bergstrand, of Upsala, has computed a preliminary value of the proper motion of Nova Persei from measures obtained from photographs with the astrophotographic refractor at Upsala Observatory. The plates were taken on 1901 March 1, 11, and September 1, 11. The probable yearly proper motion is

$$\text{in R.A.} = \mu = -0^{s}.05$$
$$\text{,, Decl.} = \mu' = -0''.7.$$

The deduced mean position of the Nova is given as

$$\left.\begin{array}{l}\text{R.A.} = 3\text{h. } 24\text{m. } 28^{s}.16 \\ \text{Decl.} = +43^{\circ}\ 33'\ 54''.0\end{array}\right\} (\text{Epoch } 1901.4.)$$

NEW VARIABLE STARS.—91 (1901) *Velorum*. Mr. A. W. Roberts announces the variability of the star having the position

$$\left.\begin{array}{l}\text{R.A.} = \text{h. } 10\ \text{m. } 16\ \text{s. } 44 \\ \text{Decl.} = -41^{\circ}\ 43'.8\end{array}\right\} (1875).$$

The changes observed indicate that the star is of the Algol type, with the following elements:—

Variation in brightness = 10·0–10·9 magnitude.
Period... ... ... = 1d. 20h. 30m. 2s.

92 (1901) *Coronae Australis*. The same observer also records as variable the star having the following position

$$\left.\begin{array}{l}\text{R.A.} = \text{h. } 18\ \text{m. } 32\ \text{s. } 45 \\ \text{Decl.} = -37^{\circ}\ 35'.8\end{array}\right\} (1875).$$

Variation in brightness = 8·0–9·0 magnitude.
Period... ... ... = about 185 days.

93 (1901) *Sagittae.* Herr F. Schwab, of Ilmenau, announces variability in the star B.D. + 19°·3975 :—

$$\left.\begin{array}{lrrr} & \text{h.} & \text{m.} & \text{s.} \\ \text{R.A.} = & 19 & 14 & 26 \\ \text{Decl.} = +19^\circ & 25' & 4 & \end{array}\right\} (1900).$$

The variability is of the Algol type. Normally the star is about 6·5 magnitude, decreasing to nearly 9·0 magnitude, remaining here for some time and then rapidly increasing. At present there are not sufficient observations for stating a value for the period, but the light curve is similar to that of U Cephei, period 17 days. The last observed minimum was November 1 at 6·30 G.M.T. (*Astronomische Nachrichten*, Bd. 157, No. 3748).

DETERMINATION OF ORBITAL ELEMENTS.—In the *Astronomical Journal* (vol. xxii. No. 510, pp. 43-52) Mr. F. C. Moulton gives a general analysis of a method of determining the elements of orbits of all excentricities from the data supplied by three observations of position, and illustrative examples of the application of the equations derived to the cases of elliptic and parabolic orbits.

THE INTERNATIONAL MEETING OF PHYSIOLOGISTS AT TURIN.

THE fifth Triennial International Congress of Physiologists, which met at Turin in September, was the largest meeting of the kind that has assembled. The fine Institute of Physiology, under the direction of Prof. Angelo Mosso and belonging to the University, was put at the disposal of the Congress. In the neighbouring Institute of Histology was installed a museum for the exhibition of apparatus and preparations pertaining to physiology. The collection was extensive and important.

The number of communications announced for the sessions of the Congress was large enough to necessitate the institution of special accessory sittings. Sections were formed for Chemical Physiology and for Psycho-physiology. It is impossible in the space at our disposal to even mention all the material brought before the Congress, or to deal with any of the contributions fully. Preference was rightly given to communications illustrated by actual experiment or by actual preparations. A fuller verbal report has appeared in a special issue of the *Archives Italiennes de Biologie* (tome xxxvi. fasc. i.)

Among the communications coming under the head of Chemical Physiology the following may be noted.

Dr. Victor Henri (Paris) reported observations on the law of the quantitative action of sucrase. If a represent the quantity of saccharose at outset, and x the quantity inverted in a period equal to t, the action does not proceed in conformity with the logarithmic law admitted by authors, $K = \frac{1}{t} \log \frac{a}{a-x}$. The value of K does not remain constant during the reaction. The law in accordance with which the reaction proceeds corresponds with a formula, $K_1 = \frac{1}{t} \log \frac{a+x}{a-x}$. The *constant of inversion* K_1 varies with the concentration of the solution of saccharose a. The product aK_1 increases with a for weak concentrations (below 5 per cent.); it remains constant for concentrations of medium strength (5 per cent. to 25 per cent.) and diminishes when a increases above 25 per cent. The fact of having acted several hours and of being in a solution laden with invert sugar does not exert appreciable influence upon the activity of the sucrase.

Dr. Frederic S. Lee (New York) reported observations made by himself and Dr. C. C. Harrold on the influence of the ingestion of sugar upon *rigor mortis*. The prolonged administration of phloridzin to fasting cats causes the muscles to pass into *rigor* within a few minutes after death. If before death dextrose be given to such phloridzinised animals, the oncoming of *rigor* is delayed. The absence of carbohydrate from the muscle favours development of *rigor mortis*; it is, on the other hand, unfavourable to contraction.

Dr. F. S. Locke (London) demonstrated by a striking experiment the action of dextrose upon the activity of the mammalian heart. The heart removed from a freshly killed rabbit was washed free from blood and suspended freely, and arrangement made for recording its contractions by means of a lever attached to the apex. Kept at a temperature of 35° C., and fed with a modified Ringer's fluid, the contractions gradually grew feeble and ultimately very weak. If then oxygen under pressure were introduced into the fluid feeding the coronary arteries, the beats rapidly increased and remained good for an hour or so, and then once more diminished and failed. Dextrose then added to the feeding fluid to the extent of 1 per cent. restored the beat once more and it continued with hardly noticeable failure for ten hours or so. The beating fails at once if for the dextrose in the feeding fluid the oxygenated Ringer solution without any dextrose is substituted; but the beat is at once restored on returning again to the sugared fluid. Sucrose, lævulose and other sugars as yet tried fail to give evidence of this restorative power. The author must be congratulated upon the able and complete manner in which he demonstrated these important facts.

Prof. Albertoni (Bologna) communicated observations on absorption of various sugars from the stomach and intestine. The sugars (glucose, saccharose, lactose) were not absorbed in the ratio of their osmotic tensions. The absorption of lactose, whether in low tension or high tension solutions, was always less than for glucose or saccharose. In the intestine he always found a fluid of higher osmotic tension than the blood. During the absorption of sugar he found a slight increase of the osmotic tension of the blood.

Prof. Röhmann (Breslau) brought forward observations on the absorption of sugars from the intestine. Equal quantities of equally concentrated solutions of hexoses (glucose, galactose, mannose, fructose, and of pentoses (arabinose and xylose) placed in the small intestine (Vella's fistula) showed at the end of an hour loss by absorption of the different stereoisomeric sugars to very different extents. The absorption is, therefore, dependent, not only on the osmotic tension, but also on the configuration of the molecule of the sugar. The absorption of the disaccharides (saccharose, lactose and maltose) was further studied in respect to the extent to which their cleavage into monosaccharides went forward. It was found that a considerable though variable proportion of these disaccharides was absorbed without cleavage occurring in the intestinal canal. But an extract of the intestinal *mucosa* could produce the cleavage; probably the portion absorbed without being split up later underwent cleavage in the mucosa itself.

Dr. Nicloux (Paris) had studied the conditions of passage of carbonic oxide from the blood of the mother to that of the fœtus. He had employed for the determination of the quantities of the gas in the blood an accurate and delicate method elaborated in his previous experiments. When the percentage of CO in the air respired by the mother lay between $\frac{1}{10000}$ and $\frac{1}{1000}$, the quantities in the blood of mother and fœtus increased *pari passu* with increase of the percentage in the air respired, and the percentage in the fœtal blood was sensibly the same as in the maternal. With a percentage of above $\frac{1}{1000}$ of the gas in the respired air the identity of the percentage in the fœtal and maternal blood disappeared. This indicated a dissociation of the carboxy-hæmoglobin of the maternal blood at the placenta as a condition of passage across it. A simple experiment supports this view. A carp is placed in water to which has been added some oxycarbonated blood (dog's). The blood of the fish comes to contain a percentage of CO six or seven times greater than that of the medium of immersion. The animal shows no toxic effect from the immersion.

Dr. Pugliese (Bologna) had with Prof. Aducco found that the addition of sodium chloride to the water taken by fasting animals considerably increased their resistance to inanition. When the tissues of animals as similar as possible in other respects, but in the one case having water only, in the other salt and water, were analysed, the tissues under the latter condition were found to contain relatively the more water. Also the amount of water daily excreted by the animals receiving salt water was less than the amount of water excreted by those receiving water without salt.

Prof. A. Walther (St. Petersburg) demonstrated the action of Pawlow's *enterokinase* on fresh pancreatic juice as tested by digestion of measured quantities of fibrin. The conversion of the zymogen in the fresh juice into trypsin is not an oxidation process, for the *enterokinase* does not give the reactions of the oxidases, nor can the zymogen in the juice be rendered active by oxidising agents. The zymogen in the pancreatic juice is therefore not the same substance as Heidenhain's zymogen in extracts of the gland-tissue. The action of the *enterokinase* upon the zymogen is probably a hydrolytic one. From the fresh pancreatic juice a proteid (globulin ?) can be precipitated